

REMARKS

Claims 1, 3, 9 to 14, and 19 to 33 are pending in the application, of which claims 1, 10, 19 and 32 are independent. Claims 23 to 33 are new. Favorable reconsideration and further examination are respectfully requested.

All of the claims were rejected under 35 U.S.C. §103 over U.S. Patent No. 6,522,640 (Liebenow) as read in light of In re Karlson. As shown above, Applicants have amended the claims to more define the invention more clearly. In view of these amendments, withdrawal of the art rejection is respectfully requested.

Each of independent claims 1, 10, and 19 has been amended to specify that the base unit comprises an automatic gain control circuit which receives a composite signal that is based on an original signal from a telephone line and an echo signal, and which generates a data signal from the composite signal by maintaining a level of the composite signal within a predetermined linear amplification region. The applied art is not understood to disclose or to suggest at least this feature of claims 1, 10, and 19.

More specifically, as correctly noted on page 3 of the Office Action (referring to dependent claims 3 and 4), Liebenow does not disclose or suggest an automatic gain control circuit for maintaining a signal within a linear amplification region. It was said, however, that an automatic gain control circuit is well known in the art and, therefore, it would have been obvious to include one in the base unit. Applicants respectfully disagree.

As understood by Applicants, it may have been known to incorporate an automatic gain control circuit in a radio receiver. For example, an automatic gain control circuit may

be inserted at an intermediate frequency portion of a radio receiver in order to compensate for variations in levels of radio frequency signals entering the receiver. What clearly was not known, however, is to incorporate an automatic gain control circuit at a transmitting end (e.g., at the base unit of the claims) in order to maintain a level of a composite signal within a predetermined linear amplification range, where the composite signal is based on an original signal from a telephone line and an echo signal. The following explanation illustrates why this arrangement would not have been obvious.

Liebenow describes a way to transmit a voiceband data signal (e.g., a V.90 signal) from a point A (an RJ11 wall jack) to a point B (a laptop computer). Referring to Figure 2 of Liebenow, a 4 kHz wide V.90 signal is first digitized into a 48 kb/s bitstream in codec 40. Packets about 0.4 seconds long are then produced in radio digital section 48, which are checked for errors in radio digital section 34. Since the presence of errors may require retransmission, and the overall transmission has to be in real-time and therefore cannot be delayed, the transmission speed of section 48 has to be much higher than the original 48 kb/s, or $4 \times 48 \text{ kb/s} = 256 \text{ kb/s}$, according to Liebenow. The bandwidth required to transmit this signal by two-phase PSK (Liebenow's method) amounts to about 256 kHz. Liebenow proposes to transmit data packets using a 75-channel frequency-hopping scheme involving master transceiver 46 and slave receiver 32. Frequency hopping increases the required transmission bandwidth to $75 \times 256 \text{ kHz} = 19.2 \text{ MHz}$.

In contrast to Liebenow's transmission scheme, in one embodiment of the invention described in the specification, an incoming V.90 data signal is applied directly to an FM deviator and an RF amplifier (thus eliminating Liebenow's circuits 40, 48 and 50).

Depending on the FM modulation index used, an RF bandwidth may vary from, e.g., 30 kHz to, e.g., 150 kHz. This is a factor of 640 to 128 lower than Liebenow's RF bandwidth of 19.2 MHz. To implement this arrangement, a relatively high linearity may be required in a portion of the RF transmission channel. The RF channel therefore may require protection from inadvertent overload. This protection is achieved via the automatic gain control circuit of the claims, i.e., by maintaining the level of the composite signal within a predetermined linear amplification range. An automatic gain control circuit, as claimed, would not have been needed in a conventional digital transmission system, such as the system described in Liebenow. As such, use of an automatic gain control circuit, as claimed, would not have been obvious.

For at least the foregoing reasons, Applicants respectfully submit that an automatic gain control circuit in the claimed base unit was not well known to those of ordinary skill in the art at the time the subject application was filed, much less an automatic gain control circuit which generates a data signal from a composite signal that is based on original and echo signals by maintaining a level of the composite signal within a predetermined linear amplification region. Should the Examiner persist in the assertion that such an automatic gain control circuit was well known, Applicants respectfully request for the Examiner to cite a reference in support of this assertion, in accordance with MPEP §2144.03

For at least the foregoing reasons, claims 1, 10, and 19, and the claims that depend therefrom, are believed to be patentable over Liebenow.

New independent claim 32 includes, *inter alia*, a base unit having an automatic gain control circuit and a transmitter. The automatic gain control circuit receives a

composite signal that is obtained from an original signal from a telephone line and an echo signal and generates a data signal from the composite signal. The automatic gain control circuit generates the data signal from the composite signal by maintaining a level of the composite signal within a linear amplification region of the transmitter. The transmitter outputs the data signal from the base unit by using analog frequency modulation (FM). As explained above, the prior art does not disclose or suggest use of an automatic gain control circuit in a the base unit which generates a data signal from a composite signal by maintaining a level of the composite signal within a predetermined linear amplification region. Accordingly, claim 32, and dependent claim 33, are believed to be allowable.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

Please apply any fees for this Amendment to Deposit Account No. 06-1050 referencing 12203-002001. A Petition for a Two-Month Extension of Time is also enclosed along with a check in the amount of \$210.00 for the requird fee.

Applicants : Ernie H. Lin, et al.
Serial No. : 09/658,049
Filed : November 8, 2000
Page : 13

Attorney Docket No.: 12203-002001

Applicants' attorney can be reached at the address shown above. Telephone calls regarding this application should be directed to 617-521-7896.

Respectfully submitted,

Date: April 5, 2004



Paul A. Pysher
Reg. No. 40,780

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906